NASA DIGITAL TELEVISION TRANSITION PLAN

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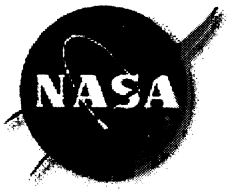

NASA
Digital Television
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Marshall Space Flight Center
Center Operations Directorate
Information Systems Department

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1.0 Introduction

This document outlines the strategy to implement digital television (DTV), including High Definition Television (HTDV) and Standard Definition Television (SDTV) throughout NASA. The strategy outlined in this document is based on Administrator Goldin's letter stating that the primary requirements for DTV are the dissemination of NASA-generated video to the public, and those areas where digital television's advanced capabilities can assist scientific research, with special emphasis on the Shuttle and International Space Station (ISS) programs. Thus, the first priority for DTV will be in areas with maximum benefit to Public Affairs Television. The second priority will be areas of benefit to the scientific community, for which DTV will provide improved imaging for many applications. The third priority will be for production and institutional capabilities.

To minimize the impact of DTV implementation on constrained budget resources, this plan will seek to balance documented requirements with a supportable implementation schedule, avoiding the risks and expense of early adoption of the technology. Due to the nature of DTV as an emerging technology, elements of this plan will likely be revised frequently. Please check with a working group member to be sure of the latest revisions. This document assumes basic knowledge of terms and technologies related to television in general, and DTV specifically. A glossary of terms is included for reference. All dates in this document should be considered fiscal year references unless otherwise noted.

In this document, Public Affairs Television refers to the capability to document and disseminate events to the public via the media (hereafter, "the media") on a real-time basis, produce "live shots" and interviews, generate animation for dissemination to help illustrate technical concepts, or produce scripted live and recorded programs for educators. Program specific television refers to television and video systems intended for the sole use of a NASA program. Video from program specific systems may be used by Public Affairs (PAO), but is a secondary use for the video. Institutional television refers to video for general Center usage, such as a Cable Access Television (CATV) distribution system or internal productions for training or safety. Video production capabilities implemented for specific purposes or programs are often used to support other areas within a Center, such as institutional video requirements or PAO events.

NASA management has determined that Agency ground and on-orbit implementation of HDTV will be accomplished primarily via commercial agreements. In May 2000, an agreement was signed with DREAMTiME Holdings, Inc., that includes the provision for HDTV capabilities at every Center, the Shuttle orbiter fleet, and the ISS. Programs or projects at a given Center may have HDTV requirements that are not within the scope of the agreement with DREAMTiME. Such HDTV requirements should be coordinated through the Center's DTV Working Group representative and the chairman of the DTV Working Group.

Implementation of Standard Definition DTV systems does not fall within the scope of the agreement with DREAMTiME and remains the responsibility of the Centers and Enterprises.

2.0 Requirements and Scope

The FCC has adopted the Advanced Television Systems Committee A53 specification for digital television as the standard for the United States. New channels have been allocated for private and publicly owned and operated television stations. Private stations in the top 30 markets began digital broadcasting in November 1999. All private stations must broadcast digital signals by December 2002 and public stations by May 2003. Analog broadcasting is scheduled to be terminated in 2006.

NASA's television infrastructure must be upgraded to provide digitally originated and produced video to the media. Analog video converted to DTV does not fully meet this requirement and should be considered only as a transitional solution. Public Affairs DTV shall be a mix of SDTV and HDTV. Use of HDTV is recommended for documentation of historically significant NASA activities and enhancement of programs.

Program specific requirements for DTV should be considered separate from this plan with regard to schedules and budget priorities. However, formats and interfaces of equipment shall adhere to NASA STD 2818. Video used for scientific research is often also utilized for public release. It is therefore imperative that digital video systems purchased for scientific use be *compatible* with NASA STD 2818. For more information, refer to the standard (http://www.msfc.nasa.gov/PCCA/baselined.html).

2.1 HDTV Transition (to be accomplished primarily by commercial partner)

To meet public affairs HDTV requirements, all Centers must have the capability to (1) generate documentary digital video imagery and disseminate it to the media on a real-time basis; (2) produce "live shots" i.e., live interviews to and from remote locations as a tool for helping NASA tell its story; and (3) generate visualizations and animation to help illustrate technical or scientific concepts. These three basic elements of NASA's Public Affairs Television constitute a core capability.

To meet these requirements, each Center shall, by May 2002 (according to the schedule and plan outlined in the Space Act Agreement with DREAMTiME), have the capability to acquire video digitally, perform "cuts only" editing, superimpose titles, and distribute video to the media in electronic form. Video acquisition shall adhere to NASA Standard 2818 (720 P60). Centers shall have the capability to edit recorded scenes together in sequences and switch between scenes in real time for live programming. Centers shall also have the capability to distribute prerecorded sequences and live programming to the media.

Imagery from space is a primary public affairs television requirement, therefore, ISS and Shuttle are a priority for transition to DTV. The goal is to improve Shuttle and ISS television capabilities to allow real-time, and non real-time, downlink of DTV for Public Affairs, mission, and scientific use. Further, use of DTV on-orbit will allow for higher resolution monitoring of experiments, in real-time, by scientists on the ground.

2.2 SDTV Transition

Each Center currently has fully developed Public Affairs, institutional, and program television and video capabilities. Due to obsolescence of current analog equipment, and scarcity of replacement analog equipment, these capabilities require near-term upgrade to digital to be completed by December 2004.

Each Center must upgrade the capability to acquire, route, edit, and distribute video from current analog systems to digital. This transition may require digital-to-analog and/or analog-to-digital conversion capability until an all-digital system is established.

It is assumed that each Center will be unable to completely transition its entire television infrastructure at one time, therefore the following priorities for transition are recommended. The highest priority is to begin acquiring video digitally, with the ability to interface with existing analog systems, "cut-editing," MPEG-2 distribution between the Centers, and digital archiving. The next priority is to establish better editing capability, again with interfaces to existing analog systems. The third priority is to make the major infrastructure upgrade of converting production switching and routing to digital. This priority also includes all major systems required to perform live production completely digitally and convert all production recording to digital. The last priority is to upgrade institutional video distribution to digital within a Center. Synergies between the DTV transition and Internet-based activities should be leveraged whenever possible to create a single path from acquisition to delivery and archival storage of content.

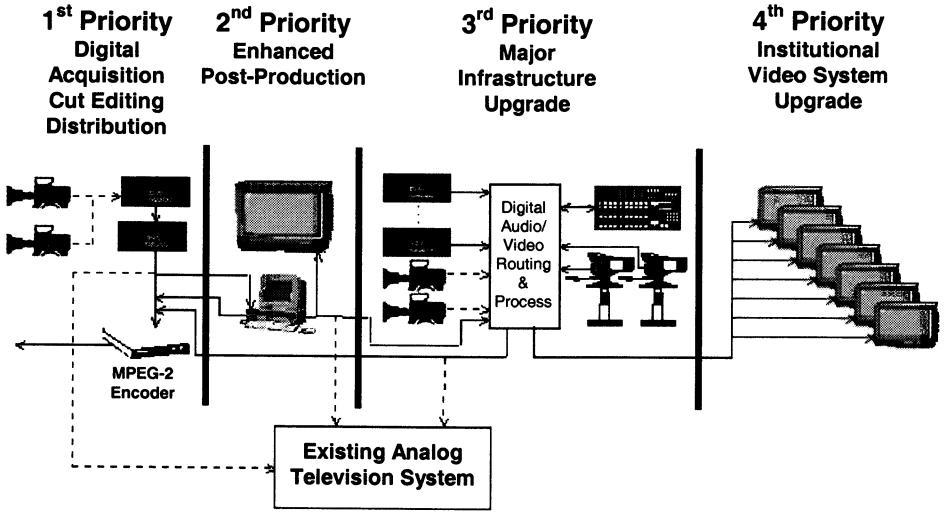

Fig. 1 Priorities for SDTV Transition

3.0 Resources for DTV Implementation

Television and video in general are rarely specifically identified in an Agencywide budget. It is not expected that specific resources will be forthcoming for DTV implementation. NASA policy is that HDTV implementation is to be accomplished primarily via commercialization, but SDTV transition is still an Agency requirement. Therefore, it is recommended that each Enterprise/Center must identify resources for on-going television and video operations and assure that these resources will allow NASA to meet Public Affairs DTV requirements. Headquarters Public Affairs Office has identified on-orbit video, launch, landing, "live shots," video files, and animation as priorities for digital television. Program TV requirements that benefit both the program and Public Affairs DTV should be given precedence for funding. Resources for ongoing television and video support should be utilized to benefit DTV priorities outlined in this document.